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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPELLANT'S MAIN BRIEF ON APPEAL

APPELLANTS:	Armin Weiss	ATTORNEY DOCKET NO:	30014200-1011
SERIAL NO.:	10/053,169	GROUP ART UNIT:	2672
FILING DATE:	November 2, 2001	EXAMINER:	Thu Thao Havan

INVENTION: "METHODS AND SYSTEMS FOR PRODUCING A 3-D ROTATIONAL IMAGE FROM A 2-D IMAGE"

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

SIR:

Appellant submits herewith, in triplicate, Appellants' Main Brief on Appeal under 37 C.F.R. §1.192 in support of the Notice of Appeal mailed on November 9, 2003. The Commissioner is hereby authorized to charge the amount of $500.00 for the requisite filing fee for filing the Main Brief on Appeal to the Appellants' Attorneys' credit card. Form 2038 is attached.

The Commissioner is hereby authorized to charge any deficiency in fees associated with this communication or credit any overpayment to Deposit Account No. 19-3140. A duplicate copy of this sheet is enclosed.

Respectfully Submitted,

(Reg. No. 45,034)

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CERTIFICATE OF MAILING

I hereby certify that this original and two copies of this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 10, 2005.

(Reg. No. 45,034)
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Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

SIR:

In accordance with the provisions of 37 C.F.R. §1.192, Appellant submits this Main Brief on Appeal in support of the Appeal of the above-referenced application.

I. REAL PARTY IN INTEREST:

The real party in interest in the present appeal is the Assignee, Sun Microsystems, Inc. The assignment was recorded in the U.S. Patent and Trademark Office at Reel 012528, Frame 0405.

II. RELATED APPEALS AND INTERFERENCES:

There are no related appeals and no related interferences.

III. STATUS OF CLAIMS:

Claims 1, 2, 4-11, 13-20 and 22-28 are pending in the application. Claims 3, 12 and 21 have been canceled. The present appeal is directed to claims 1, 2, 4-11, 13-20 and 22-28, which were finally rejected in an Office Action dated July 12, 2004. A copy of the non-canceled claims 1, 2, 4-11, 13-20 and 22-28 is appended hereto as Appendix A.

The status of the claims on appeal is as follows:

Claims 1, 2, 4-11, 13-20 and 22-28 are rejected under 35 U.S.C. §102(e) as being allegedly anticipated by *Hanratty* (U.S. Patent No. 5,990,897).

IV. STATUS OF AMENDMENTS:

All amendments have been entered in this application.

Appellant notes that Appellant submitted a Response "B" After Final Accompanying the Notice of Appeal mailed on November 9, 2004. Appellant has not received a communication from the Examiner regarding the Response "B."

V. SUMMARY OF THE INVENTION:

This application relates to methods, systems and articles of manufacture for producing a three-dimensional (3-D) rotational image from a two-dimensional (2-D) image. (Page 2, lines 6-8). Objects of a 2-D image are assigned to one of a plurality of sequential layers that correspond to visually depicted depths of the objects in the 2-D image. In an illustrative example, Figure 4A shows a 2-D image 400 including a number of objects 401, 402, 403 and 404. As can be seen in Figure 4A, some of the objects are shown visually closer than others. For example, object 402 is at a visually depicted depth that is closer to the viewer than objects 401 and 403. The objects are assigned to one of a plurality of sequential layers that correspond to the visually depicted depths of the object. In other words, object 402 is assigned to a different layer than objects 401 and 403 because object 402 is depicted closer to the viewer than objects 401 and 403. Figure 4C is a top view of the illustrative objects wherein the objects are shown assigned to layers at respective visually depicted depths. Since the objects are assigned to sequential layers that correspond to their visually depicted depths, in the illustrative example, object 401 is assigned to a layer (*e.g.*, layer 1), object 403 is assigned to a next layer (*e.g.*, layer 2), object 402 is assigned to a further next layer (*e.g.*, layer 3), and object 404 is assigned to another further next layer (*e.g.*, layer 4). (Page 9, line 13-page 10, line 5; page 11, lines 8-23; Figures 4A and 4C).

The objects of each layer are rotated around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form a three-dimensional (3-D) rotational image. Referring to the illustrative example of Figures 4B and 4D, the illustrative objects are rotated around a common rotational axis, which is positioned at the origin of angle (Tvar/2), to form a 3-D rotational image. (Page 15, lines 1-30; Figures 4B and 4D).

The 3-D rotational image has a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle. For example, as illustratively shown in Figure 4D, object 402 is rotated to the maximum rotational angle and object 401 is rotated to the minimum rotational angle. The 3-D rotational image is displayed. (Page 15, lines 1-30; Figures 4B and 4D).

VI. ISSUES:

The issue on Appeal is as follows:

Whether the subject matter of claims 1, 2, 4-11, 13-20 and 22-28 are anticipated, under the provisions of 35 U.S.C. §102(e), based on the teachings of *Hanratty* (U.S. Patent No. 5,990,897).

VII. GROUPING OF CLAIMS:

Claims 1-9 stand or fall together as method claims. Claims 10-19 stand or fall together as computer-readable medium claims. Claims 19-27 stand or fall together as system claims. Claim 28 stands on its own as a data structure claim.

VIII. ARGUMENT:

Claims 1, 2, 4-11, 13-20 and 22-28 are not anticipated under 35 U.S.C. §102(b) based on the teachings of *Hanratty*

A. The Claimed Invention

The claimed invention claims methods, systems and articles of manufacture for producing a three-dimensional (3-D) rotational image from a two-dimensional (2-D) image including a plurality of objects. Each object in the 2-D image is assigned to one of a plurality of sequential layers that correspond to visually depicted depths of the objects in the 2-D image. The objects of each layer are rotated around a common rotational axis, which is common for the plurality of layers, to form the 3-D rotational image. The 3-D rotational image has a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle. The 3-D rotational image is displayed. The present application contains seven independent claims, namely claims 1, 9, 10, 18, 19, 27 and 28.

Claims 1 and 9 claim methods in a data processing system for producing a 3-D rotational image from a 2-D image including a plurality of objects.

Claims 10 and 18 claim computer-readable media containing instructions that cause a data processing system to perform a method for producing a 3-D rotational image from a 2-D image including a plurality of objects.

Claims 19 and 27 claim data processing systems for producing a 3-D rotational image from a 2-D image including a plurality of objects.

Claim 28 claims a computer-readable memory device encoded with a data structure with entries, each reflecting a layer associated with a visually depicted depth in a two-dimensional image including a plurality of objects, wherein a three-dimensional rotational image is produced from the two-dimensional image by a program which is encoded on the memory device and which is run by a processor in a system, each entry comprising: a storage area in which is stored one of the plurality of objects assigned to the layer by the program, wherein the program rotates

the objects of each layer around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form the three-dimensional rotational image having a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle, and displays the three-dimensional rotational image.

B. The Rejection

The Final Rejection rejects the pending claims as being allegedly anticipated by *Hanratty*. *Hanratty* discloses a method for producing a 3-D solid from 2-D drawing views. The Examiner argues that, in *Hanratty*, a base solid is generated using a rotational sweep technique

> "by ascertaining the profile of the three dimensional object and rotating that profile about the axis of symmetry. This may suitably be accomplished through the use of computing the locus of points resulting from a curve rotated in arbitrarily small increments about a straight line. Wherein an axis of rotation is then defined according to whether the working view is the front or back view. In the front view, the axis of rotation is defined as the YMIN line. In the back view, the axis of rotation is defined as the YMAX line."

(Office Action of July 12, 2004, page 4). The Examiner argues that when the front view or back view is rotated, the view is rotated out of the drawing plane, line a "barn-raising." *Id.* The Examiner argues that the view is rotated about a rotation point 0.1 inches outside the current view. *Id.* at 2.

The Examiner further argues that

> "[a]fter defining a rotation point, a rotation angle is defined as the angle that MATCHCURV makes with the positive X-axis. The system then determines the actual work view number (i.e., the number corresponding to the particular oblique view of interest) then rotates a number of curves and curve sets counter clockwise about the rotation point by ROTANG degrees. The curves rotated about this point suitably comprise: 1) the top main boundary, 2) the entire oblique view, 3) the active curve set, and 4) the OCSEND curve."

Id. at 2, 3.

Thus, the Examiner describes the Examiner's interpretation of how *Hanratty* rotates an entire view or a curve set about rotational axes. Appellant submits that although *Hanratty* may rotate an entire view or a curve set about respective rotational axes, nowhere does *Hanratty* disclose or even suggest rotating objects of *sequential layers* around a *common rotational axis* to different *rotational angles corresponding to the layers*. In fact, *Hanratty* fails to even mention layers, which is evidence by the Examiner merely stating that object are assigned to layers in *Hanratty* with no description or support from *Hanratty*. *Id.* at 3. Further, while the final

rejection describes that *Hanratty* rotates an entire view or a curve set about rotational axes, the final rejection fails to argue how *Hanratty* rotates objects of *sequential layers* around a *common rotational axis* to different *rotational angles corresponding to the layers*, because *Hanratty* fails to even assign objects to layers.

C. *Hanratty* Fails to Anticipate the Claimed Invention

Appellant submits that none of the claims are anticipated by *Hanratty*. *Hanratty* fails to disclose or even suggest features of the claimed invention, namely rotating objects of different layers around a common rotational axis to different rotational angles corresponding to the layers. Instead, *Hanratty* discloses a method for generating a 3-D image of a solid from different 2-D views of the solid. Specifically, *Hanratty* derives a 3-D image of a solid from a 2-D top view, a 2-D view of each side, a 2-D bottom view, and a 2-D oblique view of the solid. For example, *Hanratty* teaches how one could derive a 3-D image of a car from a 2-D top view of the car, a 2-D view of each side of the car, a 2-D bottom view of the car, and a 2-D oblique view of the car.

1. *Hanratty* fails to teach assigning each object in a 2-D image to one of a plurality of sequential layers that correspond to visually depicted depths of the objects in the 2-D image

To begin with, contrary to the Examiner's assertions, *Hanratty* fails to disclose or even suggest assigning each object in a 2-D image to one of a plurality of sequential layers that correspond to visually depicted depths of the objects in the two-dimensional image. *Hanratty* derives a 3-D image of a solid from various 2-D views of the solid. That is, *Hanratty* looks at the different 2-D views and pieces together corresponding lines from each view to derive the 3-D solid. More particularly, *Hanratty* initially divides each of its 2-D images into curves. (Col. 6, lines 30-col. 7, line 16). For example, if *Hanratty's* bottom view image consists of a square, then *Hanratty* initially sees the square as four individual line curves. Then, *Hanratty* attempts to group the curves into shapes (*e.g.*, a square) by identifying closed curve sets and open curve sets.

(Col. 7, lines 55-58). After shapes in a view are identified, the entire working view is rotated, as a single entity, to a proper three-dimensional spatial relationship with the other views. For example, the bottom view is rotated to be aligned such that it is positioned beneath the top view and coincident with the side views. (Col. 8, lines 37-57). Then, *Hanratty* closes disjointed curves. (Col. 8, lines 58-65).

Thus, unlike Appellant's claimed invention, *Hanratty* fails to disclose assigning objects of a 2-D image to sequential layers that correspond to visually depicted depths. Instead, *Hanratty* first treats curves individually, then treats curve sets individually, and then treats an entire view as a single object. Nowhere does *Hanratty* even discuss that its curves, curve sets or views are assigned to layers. In fact, *Hanratty* does not even mention the term "layers," let alone assigning different objects of a 2-D image to <u>sequential</u> layers corresponding to their visually depicted depths.

In the final rejection, the Examiner cites *Hanratty* col. 3, lines 18-55 to support the Examiner's argument that *Hanratty* assigns objects of a 2-D image to layers that correspond to visually depicted depths. However, that passage fails to even relate to assigning objects to layers, let alone layers that correspond to visually depicted depths. That passage from *Hanratty* merely describes treating curves as primitives, not assigning objects to layers that correspond to visually depicted depths.

Therefore, for at least these reasons, *Hanratty* fails to anticipate claims 1, 9, 10, 18, 19, 27 and 28.

2. <u>*Hanratty* fails to teach rotating objects of each layer as claimed by Appellant</u>

Further, *Hanratty* fails to disclose or even suggest rotating objects of each layer around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form a three-dimensional rotational image having a maximum

rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle. As discussed above, *Hanratty* fails to disclose or even suggest assigning objects of a 2-D image to sequential layers that correspond to visual depicted depths. Thus, for at least this reason, *Hanratty* could not disclose or even suggest rotating the objects of a 2-D image that are assigned to sequential layers around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers.

In the final rejection, the Examiner cites *Hanratty* col. 36, line 6-col. 37, line 35, and argues that that passage discloses the claimed subject matter relating to rotating objects. However, that passage fails to even relate to rotating objects of different sequential layers. That passage from *Hanratty* merely describes adding a line to close a curve set when two adjacent open curve sets meet at the line.

Accordingly, for at least these additional reasons, *Hanratty* fails to disclose or even suggest Applicant's independent claims 1, 9, 10, 18, 19, 27 and 28.

Claims 2, 4-8, 11, 13-17, 20 and 22-26 depend directly or indirectly from claims 1, 9, 10, 18, or 19 and are therefore allowable for at least the same reasons that claims 1, 9, 10, 18, and 19 are allowable.

Accordingly, Appellant respectfully requests that the Board reverse the rejection of the pending claims under 35 U.S.C. §102(e).

IX. CONCLUSION:

For the foregoing reasons, Appellant respectfully submits that the rejection posed by the Examiner is improper as a matter of law and fact. Accordingly, Appellant respectfully requests the Board reverse the rejections of claims 1, 2, 4-11, 13-20 and 22-28 and allow claims 1, 2, 4-11, 13-20 and 22-28.

Respectfully submitted,

_________________ (Reg. No. 45,034)
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APPENDIX A

1. (Previously presented) A method in a data processing system for producing a three-dimensional rotational image from a two-dimensional image including a plurality of objects, the method comprising the steps of:

assigning each object to one of a plurality of sequential layers that correspond to visually depicted depths of the objects in the two-dimensional image;

rotating the objects of each layer around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form the three-dimensional rotational image having a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle; and

displaying the three-dimensional rotational image.

2. (Original) The method of claim 1, wherein the objects are assigned to the layers so that within a given layer the object assigned to that layer neither overlaps with nor is included within another object in the given layer.

3. (Canceled).

4. (Previously presented) The method of claim 1, wherein the three-dimensional rotational image is symmetrical with respect to a plane in which the common rotational axis is located.

5. (Original) The method of claim 1, further comprising the step of:

when rotatively displaying the objects, modifying an area of each object by a predetermined scaling factor.

6. (Original) The method of claim 1, further comprising the step of:

prior to assigning the objects to the layers, ordering the objects in a sequence based on depths of the objects in the two-dimensional image.

7. (Original) The method of claim 6, wherein the objects are ordered so that the object having a greatest depth is first in the sequence.

8. (Original) The method of claim 6, wherein the objects are assigned to one of the plurality of sequential layers, beginning with a first object in the sequence.

9. (Previously presented) A method in a data processing system for producing a three-dimensional rotational image from a two-dimensional image including a plurality of objects, the method comprising the steps of:

ordering the objects in a sequence based on depths of the objects in the two-dimensional image;

sequentially assigning each object in the sequence to one of a plurality of layers so that within a given layer an object assigned to that layer neither overlaps with another object in the given layer, nor is included within another object in the given layer;

rotating the objects of each layer around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form the three-dimensional rotational image having a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle; and

displaying the three-dimensional rotational image.

10. (Previously presented) A computer-readable medium containing instructions that cause a data processing system to perform a method for producing a three-dimensional rotational image from a two-dimensional image including a plurality of objects, the method comprising the steps of:

assigning each object to one of a plurality of sequential layers that correspond to visually depicted depths of the objects in the two-dimensional image;

rotating the objects of each layer around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form the three-dimensional rotational image having a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less

than or equal to the maximum rotational angle; and

displaying the three-dimensional rotational image.

11. (Original) The computer-readable medium of claim 10, wherein the objects are assigned to the layers so that within a given layer the object assigned to that layer neither overlaps with nor is included within another object in the given layer.

12. (Canceled).

13. (Previously presented) The computer-readable medium of claim 10, wherein the three-dimensional rotational image is symmetrical with respect to a plane in which the common rotational axis is located.

14. (Original) The computer-readable medium of claim 10, further comprising the step of:

when rotatively displaying the objects, modifying an area of each object by a predetermined scaling factor.

15. (Original) The computer-readable medium of claim 10, further comprising the step of:

prior to assigning the objects to the layers, ordering the objects in a sequence based on depths of the objects in the two-dimensional image.

16. (Original) The computer-readable medium of claim 15, wherein the objects are ordered so that the object having a greatest depth is first in the sequence.

17. (Original) The computer-readable medium of claim 15, wherein the objects are assigned to one of the plurality of sequential layers, beginning with a first object in the sequence.

18. (Previously presented) A computer-readable medium containing instructions that cause a data processing system to perform a method for producing a three-dimensional rotational image from a two-dimensional image including a plurality of objects, the method comprising the steps of:

ordering the objects in a sequence based on depths of the objects in the two-dimensional image;

sequentially assigning each object in the sequence to one of a plurality of layers so that within a given layer an object assigned to that layer neither overlaps with another object in the given layer, nor is included within another object in the given layer;

rotating the objects of each layer around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form the three-dimensional rotational image having a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle; and

displaying the three-dimensional rotational image.

19. (Previously presented) A data processing system for producing a three-dimensional rotational image from a two-dimensional image including a plurality of objects, the data processing system comprising:

a memory comprising a program that

assigns each object to one of a plurality of sequential layers that correspond to visually depicted depths of the objects in the two-dimensional image,

rotates the objects of each layer around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form the three-dimensional rotational image having a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle; and

displays the three-dimensional rotational image; and

a processing unit that runs the program.

20. (Original) The data processing system of claim 19, wherein the objects are assigned to the layers so that within a given layer the object assigned to that layer neither overlaps with nor is included within another object in the given layer.

21. (Canceled).

22. (Previously presented) The data processing system of claim 19, wherein the three-dimensional rotational image is symmetrical with respect to a plane in which the common rotational axis is located.

23. (Original) The data processing system of claim 19, further comprising the step of:

when rotatively displaying the objects, modifying an area of each object by a predetermined scaling factor.

24. (Original) The data processing system of claim 19, further comprising the step of:

prior to assigning the objects to the layers, ordering the objects in a sequence based on depths of the objects in the two-dimensional image.

25. (Original) The data processing system of claim 24, wherein the objects are ordered so that the object having a greatest depth is first in the sequence.

26. (Original) The data processing system of claim 24, wherein the objects are assigned to one of the plurality of sequential layers, beginning with a first object in the sequence.

27. (Previously presented) A data processing system for producing a three-dimensional rotational image from a two-dimensional image including a plurality of objects, the data processing system comprising:

means for assigning each object to one of a plurality of sequential layers that correspond to visually depicted depths of the objects in the two-dimensional image;

means for rotating the objects of each layer around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form the three-dimensional rotational image having a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle; and

means for displaying the three-dimensional rotational image.

28. (Previously presented) A computer-readable memory device encoded with a data

structure with entries, each entry reflecting a layer associated with a visually depicted depth in a two-dimensional image including a plurality of objects, wherein a three-dimensional rotational image is produced from the two-dimensional image by a program which is encoded on the memory device and which is run by a processor in a system, each entry comprising:

a storage area in which is stored one of the plurality of objects assigned to the layer by the program, wherein the program rotates the objects of each layer around a common rotational axis, the common rotational axis being the common rotational axis for the plurality of layers, to form the three-dimensional rotational image having a maximum rotational angle around the common rotational axis with each object in a first of the layers having a minimum rotational angle and objects in layers other than the first layer having a rotational angle greater than the minimum rotational angle and less than or equal to the maximum rotational angle, and displays the three-dimensional rotational image.